Breaking the Chains of Inflexible Legacy Network Technologies

How to replace aging SDH and Ethernet networks with Ciena's latest-generation routing and switching aggregation platforms to take future traffic growth in stride, reduce operating costs, and bring new revenue-generating services to market faster.

Inflexible legacy routing and switching architectures make it difficult to bring new services to market quickly or scale them efficiently, often requiring additional hardware to increase network capacity. As an added challenge, end-of-life aggregation equipment is expensive and costly to run—increasing reliability risks and unplanned service downtime. Ciena's new routing and switching aggregation platforms can assist in overcoming these challenges. These solutions dramatically simplify network architectures compared to legacy routing and switching designs, lowering networking costs and reducing management requirements. Additionally, Ciena's platforms scale on demand to help take future traffic loads in stride—with built-in IP protocols to converge multiple services, including business Ethernet, mobile backhaul, residential broadband, and legacy SDH services— on the same highly efficient network architecture.

Ciena's transformative routing and switching aggregation platforms

Ciena's latest-generation routing and switching aggregation platforms help overcome the cost and scalability challenges of legacy routing and switching network designs. This is achieved by updating architectures and replacing sprawling legacy infrastructure with a smaller number of highly scalable Ethernet nodes that can deliver bandwidth on demand. The upgraded infrastructure allows networks to support current and future traffic demands, with no additional hardware requirements or costs.

Ciena's platforms also incorporate Blue Planet® software, which gives unparalleled insights into network performance, resource utilization, assets, and more. Blue Planet software underpins a number of important network capabilities, including Bandwidth-on-Demand, zero-touch multi-domain and multi-vendor service provisioning, and real-time telemetry data for network performance insights and capacity planning. With Ciena's Manage, Control and Plan (MCP) domain controller, enterprises can also manage their networks from a single interface to reduce complexity and costs.

Another key benefit of Ciena's routing and switching platforms is the ability to support any number of services—including business Ethernet, cloud, 4G/5G, and residential broadband services—on the same converged infrastructure, with no need for a costly, complex, full-featured IP stack. In addition, Ciena's platforms support legacy SDH services to ensure continuity for end-customers, with no disruption or downtime.

Flexibility to support any type of network architecture

Ciena's routing and switching aggregation platforms support all kinds of transport architectures, including dynamic and static networking models. Ciena's equipment currently supports IP routing, SR-MPLS, Carrier Ethernet, and SRv6-ready to offer full control over future network evolution.

For those who choose to operate the network on G.8032 or MPLS-TP, end-to-end service provisioning can be carried out in the P/PE IP router and Ethernet aggregation domains. Equally, those using MPLS can provision services quickly and easily from end to end via the MPLS control plane. Segment Routing Traffic Engineering (SR-TE) policies can also be used to improve Quality of Experience (QoE) by dynamically aligning application preferences.

Optimize traffic aggregation in single and multi-vendor environments

Ciena's Routing and Switching Platforms optimize aggregation for:

- **Single-vendor environments** where traffic flows back into the MPLS core network (PE routers) via a standard Ethernet connection. End-to-end service provisioning is carried out separately in the PE router and Ethernet aggregation domains.

- **Multi-vendor environments** where MPLS is used as a common IP transport layer across the metro aggregation switches and PE routers. As well as adding 50ms of protection for aggregation resilience, MPLS enables simplified, end-to-end provisioning of metro Ethernet services in the aggregation layer.

What are the benefits?

With Ciena's routing and switching aggregation platforms, vast quantities of traffic can be delivered from the access network into the MPLS core extremely efficiently, lowering costs and ensuring excellent Quality of Service (QoS) for high-bandwidth and low-latency use cases. Bandwidth can also be scaled programmatically on demand, ensuring that networks can take future traffic demands in stride and support new high-bandwidth and low-latency use cases without deploying and configuring additional hardware, such as routers.

Critically, Ciena's routing and switching aggregation platforms support multiple services without the need to run a costly, full-featured IP stack on all network devices. This right-sized support for IP services means never paying for functionality that's not needed.

Other key benefits of Ciena's routing and switching aggregation platforms include:

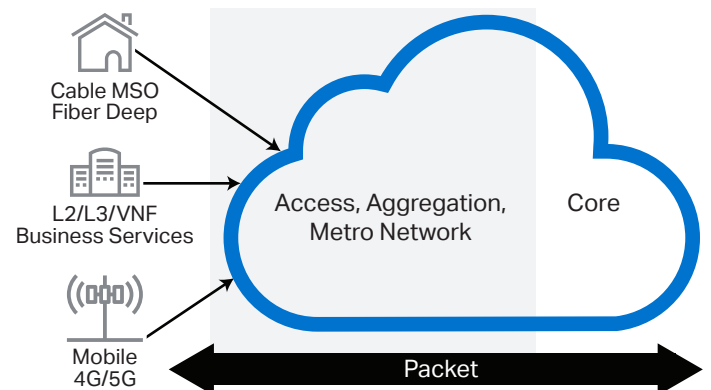### Differentiation through accelerated service velocity

Service velocity has become a critical competitive advantage for cloud, mobile, and wholesale operators. In many cases, service velocity is the determining factor in winning new service opportunities. Ciena's unique Zero-Touch Provisioning (ZTP) and Secure Zero-Touch Provisioning (SZTP) capabilities allow operators to deploy new packet-based services rapidly and securely in a fully automated manner. By reducing or eliminating costly and time-consuming manual intervention, provisioning errors are eliminated via ZTP and SZTP. Most importantly, both improve service deployment velocity and provide a significant competitive advantage.

Reduced network TCO

With routing and switching aggregation, far more traffic can be handled with fewer larger Ethernet nodes. The results are a smaller network footprint compared to traditional routing and switching architectures, and reduced memory and processing requirements compared to traditional IP network designs. As an additional benefit, multiple traffic and service types can be converged onto the same infrastructure, allowing the retirement of multiple networks that support vertical use cases such as business Ethernet services, mobile backhaul, residential bandwidth, or others.

Simplified network management

Ciena's MCP domain controller offers a unique and comprehensive approach for the administration of mission-critical networks that span access, metro, and core domains, and provides unprecedented multi-layer visibility from the photonic to the data layers. With this innovative programmable and automatable management approach, MCP provides a fully open approach to installing, manipulating, and monitoring service behaviors in an SDN environment.

Cable MSO Fiber Deep

L2/L3/VNF Business Services

Mobile 4G/5G

Access, Aggregation, Metro Network

Core

Packet

Scalability on demand to meet future traffic demands

Ciena's routing and switching platforms comprise of integrated DWDM and optical capabilities in both single- and multi-vendor aggregation scenarios. This allows available bandwidth to be scaled programmatically on demand, ensuring networks can keep pace with rapid traffic growth in new markets or geographies.

With virtually unlimited scalability on demand based on Ciena's programmable 100G, 200G, 400G, and 800G coherent optics, Ciena's routing and switching aggregation platforms future-proof network investments in the long term and extend ROI.

Carrier-grade transport as standard

With Ciena's next-generation aggregation platforms, SDH and Ethernet services can be migrated onto an operator-grade network to maximize service reliability and performance. Ciena's carrier-grade aggregation ring connects into the PE router using a standard Ethernet connection for simplicity and cost effectiveness.

De-risking network migration

Ciena supports its customers through the most complex network upgrade projects. This process begins with an in-depth consultation to fully understand the existing network and plan an appropriate migration strategy. Ciena then creates a migration roadmap that reduces risk by running the existing and future networks in parallel, and migrating services onto the new aggregation network in a number of phases. Ciena can provide specific, hands-on support for the migration, depending on any resource gaps.

Ciena's collaborative approach and end-to-end deployment support helps navigate through the migration and ensure constant uptime for customers throughout. Ciena's expertise delivering similar network projects also ensures networks are delivered on time, on budget, and to the highest quality standards.

(?) Was this content useful?   Yes   No

ciena